CLAIMS

What is claimed is:

1. A process control element adapted to be used as a portion of a process control routine implemented on a processor to control a process, the process control element comprising:

a computer readable medium; and

a control block stored on the computer readable medium and adapted to be executed on the processor to implement control of the process, the control block including,

a first plurality of inputs, wherein each input is adapted to receive a different one of a set of process parameters;

a second plurality of outputs, wherein each output is adapted to be communicatively coupled to a different process input for controlling the set of process parameters;

control logic responsive to the first plurality of inputs to produce a control signal at each of the second plurality of outputs; and

an execution rate block adapted to receive values of a parameter related to the process and to compute an execution rate for the control logic based on the parameter.

2. The process control element of claim 1, wherein the execution rate block includes a filter adapted to filter the parameter.

3. The process control element of claim 2, wherein the execution rate block further includes a computation block that determines the execution rate for the control logic based on the filtered parameter.

4. The process control element of claim 3, further including a limiter adapted to limit the execution rate determined by the computation block.

5. The process control element of claim 1, wherein the execution rate block includes a computation block that determines the execution rate for the control logic as a linear function of the parameter.

6. The process control element of claim 1, wherein the execution rate block includes a computation block that determines the execution rate for the control logic as a non-linear function of the parameter.

7. The process control element of claim 1, wherein the execution rate block is further adapted to receive values of a second parameter and to determine the execution rate of the logic block as a function of the parameter and the second parameter.

8. The process control element of claim 1, wherein the execution rate block is adapted to receive the parameter indicative of process throughput and to determine the execution rate of the control logic based on values of the process throughput.

9. The process control element of claim 1, wherein the control logic includes model predictive control logic.

10. The process control element of claim 1, wherein the control logic includes neural network control logic.

11. A process controller adapted to control a process having a plurality of field devices, the process controller comprising:

a processor;

a memory;

a control block stored on the memory and adapted to be executed by the processor to perform control calculations to produce one or more control signals for controlling the process, the control block being adapted to execute on the processor at an execution rate; and

an execution rate block stored on the memory and adapted to be executed on the processor to determine the execution rate of the control block based on a value of a parameter associated with the process.

12. The process controller of claim 11, wherein the execution rate block includes a filter adapted to filter the parameter associated with the process.

13. The process controller of claim 12, wherein the execution rate block further includes a computation block that determines the execution rate for the control block based on the filtered value of the parameter.

14. The process controller of claim 13, further including a limiter adapted to limit the execution rate determined by the computation block.

15. The process controller of claim 11, wherein the execution rate block includes a computation block that determines the execution rate for the control block as a linear function of the parameter.

16. The process controller of claim 11, wherein the execution rate block includes a computation block that determines the execution rate for the control block as a non-linear function of the parameter.

17. The process controller of claim 11, wherein the execution rate block is further adapted to determine the execution rate of the control block as a function of the parameter and a second parameter.

18. The process controller of claim 11, wherein the execution rate block is adapted to determine the execution rate of the control block based on a value associated with process throughput.

19. The process controller of claim 11, wherein the control block is adapted to perform model predictive control.

20. The process controller of claim 11, wherein the control block is a multiple input/multiple output control block.

21. The process controller of claim 20, wherein the control block is adapted to perform neural network control logic.

22. A process control element adapted to be used to assist in controlling a process having a process control system that executes a control block on a processor at an execution rate to perform process control functions within the process, the process control element comprising:

a memory; and

an execution rate block stored on the memory and adapted to be executed on the processor to determine the execution rate of the control block during operation of the process based on values of a parameter associated with the process.

23. The process control element of claim 22, wherein the execution rate block includes a filter adapted to filter the parameter associated with the process.

24. The process control element of claim 23, wherein the execution rate block further includes a computation block that determines the execution rate for the control block based on the filtered value of the parameter.

25. The process control element of claim 24, wherein the execution rate block further includes a limiter adapted to limit the execution rate determined by the computation block.

26. The process control element of claim 22, wherein the execution rate block includes a computation block that determines the execution rate for the control block as a linear function of the parameter.

27. The process control element of claim 22, wherein the execution rate block includes a computation block that determines the execution rate for the control block as a non-linear function of the parameter.

28. The process control element of claim 22, wherein the execution rate block is further adapted to determine the execution rate of the control block as a function of the parameter and a second parameter.

29. A method of controlling a process having process delay that is a function of a parameter, the method comprising the steps of:

executing, at an execution rate, a control block that implements multiple input/multiple output control during operation of the process;

obtaining an indication of the parameter; and

determining the execution rate of the control block as a function of the indication of the parameter.

30. The method of claim 29, wherein the step of obtaining includes the step of measuring the parameter during operation of the process.

31. The method of claim 29, wherein the step of obtaining includes the step of determining a throughput of the process.

32. The method of claim 29, wherein the step of obtaining includes the step of determining a feed rate of the process.

33. The method of claim 29, wherein the step of executing includes the step of executing a control block that implements model predictive control at the execution rate.

34. The method of claim 29, wherein the step of determining includes the step of filtering the measured parameter.

35. The method of claim 34, wherein the step of determining further includes the step of calculating the execution rate and limiting the calculated execution rate.

36. The method of claim 29, wherein the step of determining includes the step of determining the execution rate as a linear function of the parameter.

37. The method of claim 29, wherein the step of determining includes the step of determining the execution rate as a non-linear function of the parameter.

38. The method of claim 29, further including the step of obtaining an indication of a second parameter and wherein the step of determining includes the step of determining the execution rate as function of the indication of the parameter and the indication of the second parameter.

39. The method of claim 29, wherein the step of obtaining includes the step of determining a dead time associated with the process.